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ABSTRACT

This evaluation report examines research on kindergarten programs and practices for children who are at risk of school failure. Programs which present evidence of positive effects and which can be replicated at other sites are identified and discussed. A proposal is made for the development of a data base which gathers information on instruction practices across sites so that their efficacy can be evaluated accurately. Factors such as the background of the students and their socioeconomic status can be held constant or disaggregated to discover the most successful strategies for different populations. The following kindergarten issues are presented: (1) preparation for first grade; (2) schedules and activities; and (3) what to do when students are unsuccessful. Three approaches to the problem are considered: repetition of the kindergarten program; extending the kindergarten day; and delivery of a specialized curriculum. Effects of each of these approaches are discussed, with the third approach--use of alternative programs of instruction individualized according to the learning avenues best suited to a particular child--receiving the most extensive treatment. The discussion, which includes detailed descriptions of six specialized programs, covers the following points: effects of programs of instruction; effective programs and students at risk; and program effectivenss and alternatives. A 17-item list of references is included. Student outcomes and program effects are presented in tables and figures. (VM)

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Report No. 21

November, 1987

EFFECTIVE KINDERGARTEN PROGRAMS AND PRACTICES FOR STUDENTS AT RISK

Nancy Karweit

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The mission of the Center for Research on Elementary and Middle Schools is to produce useful knowledge about how elementary and middle schools can foster growth in students' learning and development, to develop and evaluate practical methods for improving the effectiveness of elementary and middle schools based on existing and new research findings, and to develop and evaluate specific strategies to help schools implement effective research-based school and classroom practices.

The Center conducts its research in three program areas: (1) Elementary Schools, (2) Middle Schools, and (3) School Improvement.

The Elementary School Program

This program works from a strong existing research base to develop, evaluate, and disseminate effective elementary school and classroom practices; synthesizes current knowledge; and analyzes survey and descriptive data to expand the knowledge base in effective elementary education.

The Middle School Program

This program's research links current knowledge about early adolescence as a stage of human development to school organization and classroom policies and practices for effective middle schools. The major task is to establish a research base to identify specific problem areas and promising practices in middle schools that will contribute to effective policy decisions and the development of effective school and classroom practices.

School Improvement Program

This program focuses on improving the organizational performance of schools in adopting and adapting innovations and developing school capacity for change.

This report, prepared by the Elementary School Program, used the "best-evidence" synthesis technique to review and identify effective kindergarten programs and practices for children who are at risk of school failure. The report complements Center Reports 19 and 20, which review effective elementary school classroom programs and effective pull-out programs respectively.

Abstract

This report examines research on kindergarten programs and practices for children who are at-risk of school failure. "Program" was defined as a set of procedures intended to be implemented as a total package and capable of being replicated by others. Evaluations had to present convincing evidence of effectiveness based on rigorous methodology. Programs presenting convincing evidence of positive effects are identified and discussed.

Kindergarten attendance is nearly universal in the United States today. About 93 percent of all five-year-olds are presently enrolled in school, primarily in kindergarten programs. However, the kindergarten experience itself is far from uniform. Kindergartens may be operated by public or private schools, may be academic or developmental in focus, may be in session for a full-day every day, a half-day every day and, more rarely, for a full-day every other day. Kindergarten, as the first introduction to the formal apparatus of schooling for many children, is an important experience, but one which clearly takes on different meaning for different children.

It is especially important to understand how these different kindergarten experiences affect students at risk of future academic difficulty. Do these students enter first grade adequately prepared to succeed in elementary school or do they enter already behind and on their way to failure? What alternatives are there for students who are not successful in the kindergarten year? And finally, what arrangements of kindergarten seem most likely to increase the chance of academic success for these students?

The purpose of this paper is to describe effective kindergarten programs and practices for students at risk of future academic failure. We emphasize kindergarten programs/practices which can be replicated -- intact programs which include curriculum materials, inservice training, and strong evidence of effectiveness. Alterable features of kindergarten, such as class size, length of day, and staffing patterns are also highlighted.

What students are at risk of later failure? Is there a single diagnostic procedure or a series of procedures to identify such students? The definition and assessment of "at risk" is both a political and methodological issue which cannot be addressed in detail here. Instead, we leave the definition of "at risk" purposely vague. Students may be at risk because they enter school with specific auditory, visual or other developmental lags. Students may be at risk because the linguistic opportunities in their daily lives are very limited and they lack the necessary background and experience in receptive and expressive language. Students may be at risk because

they lack the necessary social/emotional skills to function semi-independently in a group setting such as a kindergarten classroom. Lastly, students may be at risk because the school program is inappropriate for them either in its approach or in its difficulty level.

The kindergarten year is pivotal for students who may encounter later academic difficulties -- it provides the basis for their success in the elementary curriculum which follows. Once viewed primarily as a year of transition and outside the realm of the elementary program, the kindergarten year today is primarily viewed as an academic/preparatory year (ERS, 1986) with clear connections to the elementary curriculum. Most of the programs in the public schools are focused either directly on academics (22 percent) or on academic preparation (63 percent).

These changes in the focus of kindergarten have gone along with changes in enrollment patterns and governance structure of kindergartens. Kindergarten enrollment has soared from about five percent of five-year-olds in 1901 to the present 93 percent. At the same time, more and more of the kindergarten programs (84 percent) are provided by public schools. There is also increasing activity by states to make the kindergarten year mandatory. Finally, kindergarten programs, which started as full-day programs but were reduced to half-day programs during the baby boom era, are moving to full-day programs again.

These changes in enrollment, provision, and length of the kindergarten day are occurring concurrently with great pressures to increase the academic standards of schools, and a renewed optimism about the efficacy of early programs for disadvantaged youths. Also, the movement against social promotions has had a general effect on escalation of the curriculum for those who are promoted (Shephard and Smith, 1985), and this has produced increasing demands for accountability for the performance of kindergarten students. In the past, when kindergartens were mainly in private schools, were attended by only some students, and were mainly focused on socialization and adjustment, questions of program effectiveness and accountability were of little interest.

Today, kindergarten teachers need to send the first grade teacher "prepared students." If children need to be ready to read in the first grade, then the kindergarten is held responsible for preparing. If children need to be ready to add and subtract in the first grade, then the kindergarten needs to teach them the necessary prerequisite number skills/concepts.

Some commentators are concerned that the push to early academics is harmful rather than beneficial to children (Elkind, 1986). The stress created by the demands of the formal learning situation, rather than benefitting students, may well place them at risk of future academic failure. Despite these concerns, the pressures for an academic kindergarten continue. In a recent survey, 61 percent of public school principals and about the same number of kindergarten teachers said the primary focus of their kindergarten program was "academic and social preparation" for first grade. About 22 percent of the principals said the primary focus was on academics. The kindergartens in urban areas were most likely to focus on academics.

Preparation for First Grade

If the major task of the kindergarten is to get students ready to read and compute, we need to know what readiness in these areas means. Many school districts are specific about the intended outcomes of the kindergarten year. As an example, Figure 1 shows the 22 objectives given by one school district. The kindergarten report card for this district indicates that kindergarten students are formally evaluated on these stated objectives.

Figure 1 About Here

Another way to examine the academic requirements for kindergarten is to look at the typical readiness tests given children in the kindergarten year. For example, consider the Metropolitan

Readiness Test, a widely used test whose validation centered on an analysis of the beginning reading process. Level I (early kindergarten) and Level II (late kindergarten) assess the following areas:

Level I	Level II
Auditory Skill Area	Auditory Skill Area
1. Auditory Memory	1. Beginning Consonants
2. Rhyming	2. Sound-Letter Correspondence
Visual Skill Area	Visual Skill Area
3. Letter Recognition	3. Visual Matching
4. Visual Matching	4. Finding Patterns
Language Skill Area	Language Skill Area
5. School Language and Listening	5. School Language
6. Quantitative Language	6. Listening
	Quantitative Skill Area
	7. Quantitative Concepts
	8. Quantitative Operations

Some of the skills --such as auditory memory and rhyming -- may not seem directly related to reading. But learning to read requires calling upon a complex combination of visual, auditory and kinesthetic skills. Visual perception is required in order to differentiate different letters, such as "w" vs. "m" and "b" vs. "d". Auditory discrimination of similar sounds, such as "t" vs. "d," is needed to link the visual to the language known orally. The sound-sight correspondence of letters (phonemes) must also be mastered. The child needs to understand the concept of a word and syllable and how blending of phonemes creates words. Short-term memory is important -- children need to be able to accurately recall the syllables they've blended, such as *an-i-mal*, not *am-i-nal*, a common occurrence. Thus, the kindergarten goal of preparing children for reading and arithmetic instruction in the first grade involves activities and tasks which may have little obvious resemblance to first-grade activities. Prerequsite skills are not necesarily the same skills

in smaller dosages or of less difficulty. Mastering prequisite skills doesn't mean working on smaller ditto sheets. Instead, readiness for reading and math involves conquering many visual, auditory and fine and gross motor skills which are necessary in the process of reading, but may not seem to be obviously connected to reading.

Kindergarten Schedule and Activities

In the recent ERS (1986) study of public kindergartens, about three-fifths of all teachers stated that they followed "definite time allotments and sequence for each activity." A fairly typical half-day kindergarten schedule might be:

8:30-8:35	Arrival/Get Together
8:35-9:25	Reading
9:25-9:45	Exploration (free time)
9:45-10:10	Math
10:10-10:25	Movement/Music
10:25-10:55	Social Living/Art
10:55-11:00	Dismissal

Reading or reading readiness instruction is typically based on a commercial reading readiness series (75% of all teachers in the ERS survey said they used the readiness series), and the teacher typically provides formal structured instruction during reading and math periods.

Objectives for the kindergarten year may be explicitly stated. For example, detailed objectives for minimum, average, and above average students may be formulated for comprehension skills (e.g., noting details, main idea, sequence, drawing conclusions), and vocabulary (e.g., phonetic analyses, short vowel, word meaning, final consonant, and consonant blends). As an example, the kindergarten objectives for the Baltimore City Public Schools covering phonetic

analyses of initial consonant sounds states that "given a picture of an object or an action and several words, one with the same beginning sound as the pictured object, the student will select the word that begins the same as the pictured object or action."

When Students are Unsuccessful

One of the major problems facing the transition from kindergarten to first grade is how to assess readiness for first grade and what to do with and for students who are deemed not ready to go on to first grade. There are varied practices for assessing student readiness for first grade work. These include teacher recommendation and judgment, results of standardized screening and assessment devices, and evaluations by specialized personnel. Bases for nonpromotion include student immaturity, low attention span, small size for kindergarten, inability to sit still, and retarded large/fine motor or language development. Concerning who is most likely to experience difficulty in kindergarten, we know that males far outnumber females, and that lower SES and minority students also outnumber their advantaged peers. The specific reasons for these referrals are quite different, however. For example, the males may be retained more often because of "immaturity" while low SES or disadvantaged students are more often retained because of language or other developmental lags.

Actions taken as a result of the failure to thrive in kindergarten generally fall into three categories -- repetition of the kindergarten program, additional time within the kindergarten year, and alternative programs. By far, the most common practice is repetition of the kindergarten year, either in the guise of pre-first, transition, or junior first-grade classes. This approach is based on the belief that children who fail to prosper in the kindergarten year are simply "young" for their age, and by letting them mature, they will be able to perform adequately and even blossom. However, the evidence on student grade repetition (discussed below) offers no support for this view.

A second approach has been to provide more time within the same year for kindergarten students, usually by extending the kindergarten day. There are several variations on this approach. One is to screen children and give only some students additional remedial or enrichment instruction. Another way is to add time for an entire school system which has a high percentage of at-risk students. Finally, many school systems which do not have a high percentage of at-risk students are extending the school day for kindergarten students anyway. We discuss the effectiveness of the increased time approach in the next section. (Also see Karweit, 1987.)

The third approach involves screening and assessment of children for learning problems prior to entry to kindergarten and the delivery of a specialized curriculum to suit their needs. This approach differs from the other two in its assumptions about learners and the role of the school and the personnel needed. It assumes that children learn in different ways and through different modalities and styles and that intervention strategies are needed to address these distinct areas of strength and weakness. This is not just individualizing instruction according to the level of difficulty of the material or rate of learning, but according to the learning avenues best suited for a particular child (e.g., visual, auditory, kinesthetic).

In the following sections, we examine the effects of the different approaches.

1. Promotional Practices

One of the outgrowths of the 1983 reform movement has been a renewed focus on standards and a renewed interest in nonpromotion as a way to achieve these standards. However, nonpromotion has not been supported as an effective policy (Holmes and Matthews, 1984; Jackson, 1975; Niklason, 1984; Shephard and Smith, 1985). Gredler (1984), after examining the effects of transition rooms for students deemed unready for first grade, concludes:

> "Analysis of the research studies of transition rooms raises questions about the degree of educational 'payoff' obtained with such programs. Research indicates that transition room children either do not perform as well or at most are equal in achievement levels to transition room eligible children placed in regular classrooms." (P. 469)

Research findings notwithstanding, schools continue to retain students as a remediation strategy, especially at the early grades. Part of the reason for continuation of the practice may be that schools cannot locate other alternatives. Also, teachers may view the practice as effective -- retained students do make some gain during the retained year, and teachers are unable to compare this gain during the retained year to gains the students would have made had they been promoted.

Shephard and Smith (1985) took advantage of the existing variation in school kindergarten retention rates to address this issue. They noted that many previous studies were flawed methodologically because the comparisons were not of equivalent students under different policies, so they sampled same-sex students with similar birthdates, family backgrounds, and entering test score data from schools with contrasting retention rates. They compared retained students with non-retained students. The results were striking. Students who had spent an additional year in kindergarten were basically identical to those control students who had been promoted. The only notable difference was that the repeaters scored one month higher (1.9 vs 1.8) on the CTBS reading comprehension test taken at the end of the first grade. One month gain for one year does not seem like a very economical practice.<1>

2. Extending the Kindergarten Day

Karweit (1987) examines the effects of full-day vs. half-day kindergarten in detail. Table 1 summarizes the the individual studies reviewed in that paper. Table 2 provides an indication of the direction of effects by the adequacy of the study design and the population served.

<1> One may take issue with the equivalence of these groups. Many referrals to repeat kindergarten are based on behavioral indicators which were not equated. Also children grow at very different rates during the kindergarten year. The entering test score may not be a very good proxy for where the students were at the end of the year when the assessment for promotion was made. Finally, there may be school level differences which drive the differences in retention rates which may also affect performance of the students. Policies such as providing students special help in the summer or after-school tutors, rather than retaining them, might have given the nonretainees additional resources as well.

Tables 1 and 2 About Here

Table 2 suggests where the effects of all-day kindergarten programs are located. Disadvantaged students who receive additional instruction are the primary source of the positive effects. Nine studies focused on the effect of full-day kindergarten for underachieving and disadvantaged students. Of the two strongest studies (using random assignment), one showed significant effects for the full-day kindergarten treatment. The other seven studies fell into the less methodologically rigorous category, and all of these found positive effects for all-day kindergarten.

There are no long-term effects demonstrated for attendance at full-day kindergarten. Only one study (Niemann and Gastright, 1981) found significant long-term effects, but limitations of this study limit the credibility of the results. First, the study compared students who had preschool and all-day kindergarten to those in half-day programs, a somewhat different comparison than in the other studies. Second, their test for equivalence of the two groups at entry into kindergarten was of unknown validity and reliability. Finally, the long-term results in the 4th and 8th grade included only 70 and 50 percent of their initial samples. Sample attrition may have been differentially important.

Other studies focusing on the effects of compensatory efforts (Lazar at al, 1977; McKey, 1985) have found that the results of the extended-day/year are primarily immediate and not long-term, and our findings support this conclusion concerning the effects of full-day kindergarten.

The finding that full-day kindergarten programs seem most effective on short-term measures for disadvantaged populations raises many new questions. To what extent is this finding due to

differences in the sheer amount of time in school or due to differences in program emphasis and focus? It seems possible that a combination of more time and greater emphasis on academic preparation is important. Studies linking the allocation of time to differences in achievement results typically find only modest results (Karweit, 1983). One primary reason is that the same allocated time can have quite varied actual usages in different classrooms, depending upon the grouping patterns, the curriculum, the teacher and the students.

An observational study of kindergarten instruction in three school districts by Meyer (1985) illustrates this point. Contrasting the use of time in districts which have half-day and full-day programs, Meyer showed that the actual amount of time on academic matters was not all that different in the full and half-day programs observed. The total minutes allocated to instruction in the half day classes (150 minute sessions) was 78 minutes, while in the full-day classes (330 minutes) the total instructional time allocated was 103 minutes. In general, the students in the full-day programs had more total minutes allocated to instruction, but some teachers in the half-day schedule actually exceeded the allocated time of some teachers in the full-day schedule. Again, individual teacher practices and curricula seemed to be important elements in determining how the school day was spent.

This suggests the importance of understanding more than the effects of the length of the kindergarten day. What instructional programs are effective for kindergarten students? What difficulties are there in operating these programs in a full-day or half day setting? Is it possible to have effective half-day programs and thus save the considerable expense in expanding the kindergarten? And if districts decide to extend their kindergarten day, what programs have been demonstrated to be effective? Do they require a full day for successful implementation?

The major conclusion from examining the effects of full-day kindergarten is that attendance at full day programs appears to be beneficial for disadvantaged students. The source of this effect --whether it is simply more time in school, or a change in the focus of the kindergarten

program which accompanied a full day -- is not clear. In the next section, we focus on the nature of the programs which seem to be effective for disadvantaged kindergarten students.

3. Effects of Programs of Instruction

There are two major sources for the programs reviewed here: programs approved by the U.S. Department of Education's Joint Dissemination Review Panel (JDRP), and programs listed in the Office of Educational Research and Improvement's Effective Compensatory Education Sourcebook (Griswold et al., 1986). The studies/programs are classified and presented (see Table 3) by the adequacy of the research design. Programs which used random assignment to treatment and control groups were weighted most heavily, followed by studies which used a matched/experimental control group design. Cohort, or before and after implementation designs, are discussed next. Given the least weight are studies which base their evidence of effectiveness on comparisons of expected fall to spring growth, or on post-test only effects.

Assessments of effective early childhood programs suffer from all the methodological difficulties discussed for elementary studies (see Madden and Slavin, 1987) but include a few of their own. One, it is much less clear what the goals of kindergarten programs may be, and there are fewer reliable measures of the goals. Measures are often homegrown tests of unknown reliability. When tests of known reliability are used, there is little consensus about which to use. For example, the 20 JDRP approved programs for kindergarten used 12 different standardized tests.

Further, the test selected may not match the objectives of the program. For example, in a school with an outstanding prekindergarten program, the principal was asked her primary goal for the prekindergarten students. She was very quick to respond, "to make them articulate." Yet no test or measure of the children's expressive language was used in evaluating the program's effectiveness. Instead, the program effects were measured using standard paper and pencil instruments.

Also, the evaluations can render false positive effects if they measure skills which improve test taking performance on narrow educational goals, but not skills which lay the foundation for future learning. For example, children can be taught to recognize numbers and count to fifty without having the necessary skills to master addition. Or children can learn at an early age to recognize letters, but still not possess the necessary language skills to learn how to read. An evaluation that shows mastery of discrete components related to reading and the separate skills related to math comprehension does not show competency in reading and math. There needs to be integration of the skills and the necessary linguistic and numeric background for the skills to be applied.

Finally, kindergarten programs may have very different goals, so that comparison of treatment and control groups can be misleading. Comparing an academic kindergarten program to a traditional control group which is basically nonacademic in orientation, one should not be surprised to find large effects on readiness activities for the academic program, since the traditional program did not intend to teach these objectives. This problem of program goal is particularly at issue for kindergarten programs because the purpose of kindergarten has been changing over time and evaluations indicate very little about the curriculum for the control group.

Table 3 provides a synopsis of the kindergarten programs for which we have evaluation data. As noted, these programs are presented by the adequacy of the research design in the following order:

1. Random assignment
2. Matched control group
3. Cohort comparison
4. Spring to spring growth (no control)
5. Fall to spring growth (no control)

Table 3 About Here

We consider studies which used random assignment, matched control groups, or cohort comparison groups to be methodologically adequate studies. Effect sizes are presented for these more adequate studies. The less rigorous methodological studies/programs are presented along with the general direction of effect.

1. Alphaphonics/Astra's Magic Math

Alphaphonics/Astra's Magic Math are two widely used and successful beginning readiness programs. Combining systematic, sequenced lessons into a game-like format, both programs are motivating and fun while still providing abundant practice and repetition of presentation. Friendly visitors from outer space (Astro for reading; Astra for math) leave a bag of lesson materials daily for the teacher and children. The suspense and anticipation derived from the magic bag appear to sustain student interest and motivation.

In the Alphaphonics program, the letters of the alphabet are introduced sequentially one at a time, in a 26-week sequence. Astro's bag contains items that start with the letter the class is studying, such as apple, (plastic) alligator, alarm clock, and an abacus for the letter A. Badges, stickers, and letters to parents are also in the bag.

There are six lessons for each letter of the alphabet. The student learns to name a letter, then to write it, and then to locate the upper and lower case example of the letter. Astro manages to create and keep a fantasy and fun-like atmosphere for the children while getting them to practice and review. Astro also brings ditto sheets or other tools for independent practice.

Astra's Magic math uses a similar outer space theme for the introduction of twenty-two math concepts in a sequenced manner. The units are introduced to the whole class. The twenty-two units cover shapes, matching, size comparison, counting and recognition of the numbers 0 to 30, number sequences, addition and subtraction of the numerals 0-5, and time in hours.

The Alphaphonics program takes about an hour each day. A typical schedule would be

1. Sing alphabet song
2. Sing poem song (for particular letter group)
3. Class discussion
4. Individual work
5. Sing poem song

The evaluation of the program used a posttest-only analysis of variance. The treatment classrooms were compared with twelve control schools in the same district, which did not differ with respect to entering IQ or SES. The achievement of treatment classes and control classes were measured at the end of kindergarten, first, second, and third grade using the Metropolitan Achievement Test. The effect sizes are .89, 1.14, .90 and 1.1 respectively for these grades. Data for the equivalence of control/experimental classes and method of assignment to treatment were not detailed.

The evaluation of Astra's Magic Math used random assignment to treatment and control classes. The effectiveness of the program was gauged by performance on the CTBS. The effect size computed here was .45 at the end of kindergarten.

The evaluations do not indicate very much about the goals and practices of the comparison group. It is likely that the comparison classrooms may have been traditional kindergarten programs which include readiness activities, but not in a systematic fashion which assures coverage, practice of skills, and teacher feedback.

There is no evidence supplied that the program is equally effective for all students or, on the other hand, that it is not effective for students at risk of failure. The general orientation of the program is that of a whole class, direct instruction model with individual assistance and remediation provided as can be accommodated. That is, remediation efforts are not structured in any specific way in these programs.

2. MECCA

MECCA (Make Every Child Capable of Achieving) is a diagnostic/ prescriptive program which provides daily observation, assessment and planning for specialized teaching depending on children's needs. Additional instruction within the classroom is provided based on students' learning profiles. The additional activities are based on a task analysis of the learning activity with which the student is having difficulty. Task analysis is the process of breaking down a learning activity into the steps necessary for its successful completion, such as breaking down the activity into its auditory, visual, gross and fine motor components. Specialized instruction, prescribed by a team composed of classroom aide, learning disabilities specialist, and classroom teacher, is provided either individually or in small groups in the classroom.

The target group of children is identified by a preschool screening with the school psychologist and a speech and language clinician. High-risk children are those who do not attain age appropriate scores on three/four areas on the DIAL taken in the spring. In September, further assessment is done on marginal and high risk students and an individual programming survey is administered to identify particular strengths and weaknesses. From this profile, an educational plan is devised.

For example, a child who has a very limited use of expressive language -- such as single word responses to questions or no usage of pronouns or adverbs -- might be placed in a speech and language program. In the beginning of the program, the child would be rewarded continuously with praise or with tokens. The basic structure of each lesson is:

1. Auditory Reception: The instructor gives verbal directions to which the student responds with a gross motor or fine motor action ("Pick up the tomato").
2. Verbalization: The child uses the language she has responded to in step 1 (" Here is the tomato").
3. Reading readiness activities are combined with a lesson using the words and sounds from the first two parts.

The lessons are structured to give the child practice in increasingly more difficult auditory reception, memory, and other readiness skills.

Eligible students were randomly assigned to the MECCA treatment or a control group. The Jansky Predictive Screening Index, an individually administered twenty-minute test, was used as the pre-test and one of the posttest measures. There are five predicting tests: Letter naming, picture naming, Gates word matching, Bender motor Gestalt, and Binet Sentence Memory. The posttests used were the Jansky and the Metropolitan Readiness Test.

The comparisons found no significant differences in pretest scores between the 37 students in the MECCA program and the 33 in the control classes. At the posttest, the MECCA group outperformed the comparison group by about seven points (effect size = +.67). Similar effects were found on the Metropolitan Readiness Posttest, where the effect size was .88.

Another comparison between students randomly assigned to MECCA and a "multi-disciplinary" comparison group shows similar results (Jansky effect size =.57, Monroe Reading Aptitude Test effect size =.96). In the comparison classrooms, the children were taught by an LD teacher and three other specialists.

The replication of effects under the multidisciplinary comparison is significant, for it suggests that the power of MECCA arises from more than its use of specialized personnel. It

suggests that the curriculum, materials, and approach are important factors in MECCA's effectiveness. Screening, diagnoses, and task analysis of learning activities target the time and resources within the school in a productive way, especially for students very much at risk of future failure.

3. TALK

The focus of Project TALK is to improve expressive and receptive language skills in children in grades K-3. This is accomplished by structured activities which foster language growth. A language specialist teaches specific expressive and receptive language lessons to the class twice a week for half-an-hour over a six-month period. The classroom teacher watches and then participates in the demonstration lessons, and conducts follow-up lessons twice each week.

The following sample indicates the type of lesson used in TALK.

LESSON 92

TITLE:
Describe All

PURPOSE
To encourage use of descriptive words of color, size, shape and quantity.

MATERIALS
List of simple descriptive words - descriptive word list

PROCEDURE:
The teacher walks through the class stopping here and there by a child. The teacher describes the child with one word. For instance, "Blonde John," "Listening Susan," "Tired Billy" and so on. The teacher may build from this by continuing and adding more descriptive words like "Pretty, blonde Sherry," "Clever, old Johnny" and so on.

Now the teacher asks the class what has been happening. A short discussion of descriptions and descriptive words should follow. How do you describe things? What kinds of words do you use to describe things? You use words that tell size, shape, color, smell, taste, feelings and so on.

The teacher will begin by standing and telling one word about herself/himself such as: tall, big, teacher, woman, etc. Now each child must stand one at a time and think of one word or a phrase to tell about him/her such as: little, red hair, freckles, braids, etc. When everyone has had a chance to tell a word then everyone can have another turn and think of still another word that tells about him/her. When a child gives a self descriptive word that might fit another child in the room, stop and discuss it -- how many people fit Mark's word -- this will broaden the lesson.

Younger children may want to pick a favorite self-descriptive word. The teacher can make a card for him/her to wear pinned on all day that describes him. This will give him a chance to explain his/her word to people who ask about it.

MORE IDEAS:
The teacher picks a simple descriptive word, such as "hard," and each child in the class must find an object in the room that fits the descriptive word, such as "hard floor," "hard desk," "hard pencil," "hard window pane," and so on. The teacher chooses one word from a box of slips with simple descriptive words written on them. Each student finds an item in the classroom that fits the descriptive word. Now the children take turns drawing a descriptive word and finding objects that fit on his/her own. For a more difficult twist, especially in the upper grades, have children draw two or three descriptive words and place them in the proper sentence order, as a big, red _____, and not a red, big _____, or two small _____, and not small two _____.

Three experimental and control schools were compared. Target groups of 26 students were randomly selected for pretesting from each grade level (K-3). In Table 3, we provide two sets of results, for over all (K-3) and K alone.

The Peabody Picture Vocabulary Test (PPVT) was used to measure receptive oral vocabulary. The expressive measure used was the vocabulary subtest of the Wechsler Intelligence Scale (WISC).

Results for the original experiment and a replication the following year gave effect sizes (across all grades) around .38. Results presented for the separate grades indicate that the program was as effective or more effective for kindergarten students as for first- through third-grade students.

The amount of actual time spent on the Project TALK activities is small compared to the results obtained. Only two hours per week are actually spent on the program. If the results are generally replicable, this program seems to be particularly powerful in its effects. Additional evaluations need to be conducted to learn if these effect sizes are generalizable.

4. MARC

Multisensory Approach to Reading and Reading Readiness Curriculum, or MARC, is a continuous progress K-1 reading program. It combines activities which emphasize knowledge through the senses with a systematic instructional delivery and management system. It is designed to enhance the likelihood of success in the beginning reading task for students from low income and/or rural backgrounds. The major goal of the program for kindergarten students is to increase their readiness skills, especially in the area of letter recognition and auditory perception of beginning sounds.

For example, introduction of a letter of the alphabet involves the use of visual, auditory, and kinesthetic avenues of learning. The MARC program specifies the steps to be followed when introducing letters. These steps are called *linkages* because they link the visual, auditory, and kinesthetic approaches. For example, the steps in this program in teaching the letter *a* are:

1. Teacher shows children the letter from the drill pack and says "This is the letter *a*." (VISUAL)
2. The teacher asks the children to give the letter name. (AUDITORY)
3. Children repeat the letter name. (AUDITORY)
4. Teacher presents the key word (apple) and introduces the sound by the key word. A is for apple. (AUDITORY, VISUAL)
5. The children repeat the key word and sound while the teacher describes how it feels in the mouth and throat. (AUDITORY)
6. The teacher asks the children to place their hands on their throat while repeating the letter name, sound and key word to "feel" the sound. (KINESTHETIC)

The project was evaluated by comparing an experimental group with a matched control group. The MARC and control classes did not differ significantly on pretests given in September of the kindergarten year (Boehm, Kulhman-Anderson IQ; SESAT I - Letters and Sounds or

Aural Comprehension). At the beginning of the next school year, the MARC students scored significantly higher than the control on tests of letters and sounds and word reading. The effect sizes obtained were +1.12 for letters and +.88 for word recognition. Because these effects were obtained for the students in a fall to fall testing, they are not as likely to have resulted solely from short-term acquisition of test-taking skills or from artifacts of the test themselves, as in fall to spring testing. A replication study also produced significant effects for the MARC group, although the effect size was smaller (+.55).

The MARC program is not currently funded by the National Diffusion Network, although materials are still available through the Florida Educational Resource for a nominal fee. The program has been successfully used in Florida in about one-third of the counties and is still being used actively in South Carolina. Project MARC has been used as a remedial program for older students as well as a regular readiness program. The inservice guide provides thorough coverage of the instructional program, assessments, grouping and program philosophy.

5. First Level Mathematics

First Level Mathematics is a continuous progress, developmentally oriented entering mathematics program. It provides a sequential curriculum and management system that provides for individual developmental growth. It is a diagnostic/prescriptive program. Children take a placement test to determine where they will be placed for instruction. Instruction may take place in small groups, or individually.

The program recognizes that many early math programs require fine motor (write numerals) and visual skills which have little to do with mathematics skill development. First Level Math does not require these fine motor skills. It teaches the children the universal language of math with concrete objects and actual physical operations, and progress is made in small steps as the child's concepts are formed.

Evaluation data are based on norm expectancy comparisons only, which unfortunately do not provide very strong evidence of success.

6. Early Prevention of School Failure

This program provides developmental screening, diagnosis, and training based on identified learning styles and modalities. Screening of four-, five-, and six-year-olds is carried out in fine and gross motor auditory, visual, and language areas using a variety of instruments: the Preschool Language Scale (PLS, developed in conjunction with the program), the Peabody Picture Vocabulary Test (PPVT), and the Developmental test of visual motor integration. On the basis of these tests, a profile is created for each child which identifies his/her strengths and weaknesses. Students who are two years or more below expectancy on two modalities are classified as high risk; one year or more below are classified as medium risk.

Students are given additional instruction in their weak areas in a pullout setting. The program presents guides for direct modality instruction in the areas of language, auditory, visual, fine and gross motor. Student profiles indicate their performance in these areas on a scale from 1 to 5.

Guides for modality instruction include correlation with major texts and breaking down a specific skill into a sequenced set of prerequisite skills. For example, if the skill is to tell stories in sequence with/without the aid of pictures, nine distinct skill performance areas are checked:

1. Child arranges picture stories in sequence.
2. Child tells story using sequence cards.
3. Child tells story in parts before retelling entire story.
4. Child uses felt pieces or fingerply to tell story.
5. Child uses pictures to tell story.
6. Child uses assorted toys and objects to tell story.
7. Child unscrambles story.
8. Child gives a narrative to the series of drawn pictures.
9. Child uses puppet to help tell a story.

The JDRP evaluations do not in general address the issue of a program's effectiveness for special populations. Data are not routinely presented which detail the progress of students by race, sex, SES or entering ability/achievement level. Thus these JDRP data are not ideally suited for addressing the question with which we began this paper.

However, as a basis for improving practices for students at risk in the kindergarten years, this data base is a worthwhile place to start. It seems likely that sound instructional programs, with demonstrated effectiveness across several sites, will be effective for most students. Analyses of aptitude-by-treatment interactions from studies of later grades do not find many interaction effects; programs effective for one subgroup tend to be effective for others (see Slavin and Madden, 1987). On the other hand, it may be that the nature of differences between the backgrounds of disadvantaged and advantaged children as they enter school would make programs differentially effective for different subgroups at the kindergarten level.

There is some evidence (Lysiak and Evans, 1976) of interaction effects for program and SES background. In this examination of the effectiveness of different kindergarten programs, they found that the lower SES students benefitted in particular from a structured curricular approach. This finding is consistent with the common wisdom about the need for structure for disadvantaged students, although it is really not clear what "structure" means. On one hand structure is conceived of as the opposite of the open classroom, itself an ill-defined intervention. On the other hand, structure is thought of as rigid and heavily prescribed. Semantics aside, structure in the sense of a systematic approach to instructional delivery is a vital ingredient for any effective program. What is striking about the kindergraten approaches here --which encompass a wide variety of philosophies --is the extent of the specificity of activities, planning and goals. Effective programs are ones which are detailed and specific.

The systematic aspects of programs may be more important in effectiveness than are the philosophical aspects. Is this a program which can be implemented on a day-to-day basis by a regular teacher facing 30 students? We do find successful systematic approaches which encompass quite different philosophies. For example, with respect to the degree of individualization and attention to individual differences, there are effective programs which basically focus on providing whole-class instruction, (that is, which do not differentiate instructional pace, delivery or content), and there are effective programs which have as their basic premise the need to focus on individual strengths and weaknesses.

This contrast is seen in the approaches taken by Early Prevention of School Failure and MARC. Early Prevention of School Failure diagnoses modality strengths and weaknesses and tailors instruction to these modalities. MARC underscores the significance of different avenues of learning but does not differentiate instruction for students based on their modality profiles. Both programs assume that an appropriate kindergarten program is multisensory in its approach -- EPSF customizes instruction or provides modality training for those below a certain cut-off point; MARC structures every lesson to include linkages among the different avenues of learning. Not only are these programs quite different in their philosophical approach to learning style differences, they require quite different staff and support personnel as well. A team of specialists including a psychologist and speech clinician is required to evaluate and screen all students in the EPSF model. Then, instruction is provided in a pull-out format to address modality weaknesses, such as practice in fine motor coordination.

Thus, although different approaches may be effective, effective kindergarten practices incorporate specific materials, management plans, activities and structures. The teachers have an instructional plan which they follow and specific activities which make sense in the context of that plan. The programs are not overly rigid, nor do they reduce teachers to automotons -- but they are specific. Such specificity is needed to insure a faithful implementation of a program.

Program Effectiveness and Alternatives

We have evaluations of reasonable adequacy which compare programs to control classes. However, we do not have data about the relative effectiveness of these different approaches or their effectiveness for different students. Is a program of screening and instruction in specific modalities more effective than a regular class-paced approach? What are the relative costs and implementation difficulties of the different approaches? These basic data are needed to make intelligent decisions about approaches to the kindergarten year -- to build on our collective past experiences in a systematic way. Otherwise, the present practice of individual districts building their individual curriculum without benefitting from the successes and failures of other locations seems likely to continue. Improving educational practice can be a cumulative effort, but it requires sustained and systematic evaluations. As the kindergarten has become the first formal academic experience for most students, the need to understand effective practices for this critical stage in students' schooling is great.

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Figure 1

EXPECTED STUDENT OUTCOMES

Kindergarten

1. Recognize and print name
2. Name colors and letters
3. Distinguish beginning sounds
4. Tell a picture story in sequence
5. Name six shapes
6. Name and count objects 0-10
7. Sequence numerals 0-10
8. Match numerals with objects 0-10
9. Color within boundaries
10. Know personal data
11. Fasten and tie shoes and coat
12. Use scissors with ease
13. Express ideas and take part in group discussion
14. Listen attentively
15. Recognize likenesses and differences
16. Practice self control
17. Work and play cooperatively
18. Follow directions
19. Complete projects promptly
20. Obey safety rules
21. Practice good health habits
22. Work independently
23. Participate in organized activities

Table 1

Summary of effects of full-day
vs. half-day kindergarten programs

Random assignment/Matched Control Group Studies

Study	Sample	Treatment	Effects	Effect Size	Notes
Johnson (1974)	Princess Anne, MD	EXP= full-day (5'15")	Fall/Spring Walker Readiness K		
	20 students	CTL= half day (2'30")	Cohort 1 posttest	.66 p<.05	
	matched on age,	Same curriculum	2	.58 ns	
Pre-post	race, SES, sex	Enrichment given	3	.08 ns	
Random assignment	and ability	full-day	Spring Stanford Achievement		
Replicated	assigned to TRT		Cohort 1 posttest only	.13 ns	
Longitudinal effects	(full-day) or	Measures:	2	.28 ns	
	CTL (half day)	Walker Readiness	3	.59 ns	
	3 experiments	Stanford Achievement	Reading Group Placement 1st		
	1970,1971&1972	Reading group grade 1	Cohort 1	.00 ns	
			2	.06 ns	
			3	.57 ns	
Winter and Klein (1970)	Two studies:	CTL=attendance am/pm	Metropolitan at end of K	+3.01 p<.005	
	1) Disadvantaged	TRT=regular+90 minutes	Stanford at end of K	.62 ns	
	treatment and	academic pgm	Stanford at end of 1st	.62 ns	
Screened; then	control selected	No pre-test difference			
random assignment to	from lowest 10%				
treatment/control	of kinder class				
	TRT: n=6				
	CTL: n=7				
	2) Advantaged	CTL=attendance regular	Pretest Peabody Picture	1.28 p<.05	
	Selected trt &	TRT=regular+90 minutes	Metropolitan at end of K (adj post)	- ns	
	control from	academic pgm	Stanford at end of K (adj post)	- ns	
	those most able		Stanford at end of 1st (adj post)	1.03 p<.05	
	to benefit	Significant pre-test			
	TRT n=26	differences favoring			
	CTL n=29	TRT			
Oliver (1980)	61 students in 4	EXP=full-day with	Clymer-Barrett Prereading Inventory	2.84 p<.05	Effect
	classes half day	structured curric.	Murphy-Durrell Prereading	1.16 p<.05	size
		117 minutes/day			inflated
Pre-post	98 students in 6	CTL=half day with			by use
ANCOVA	classes full-day	same structured			of class
No pretest differences		curriculum 83.8			means
Comparable	Cambridge, MA	minutes per day			
program					

Table 1 (cont'd)

Summary of effects of full-day
and half-day kindergarten programs

Non matched groups/pre-post studies

Study	Sample	Treatment	Effects	Size	Notes
Carapella and Loveridge (1978) ANCOVA both groups eligible, control group of non-participants who were eligible	St. Louis public schools 507 students who scored below 50th percentile on CPI who were eligible for attendance at extended day kindergarten 273 enrolled 234 control	Supplementary instruction for kindergarten pupils using small group and individual instruction in extended day	Comprehensive Test of Basic Skills Mathematics Reading	 .43 p<.001 .32 p<.001	
Nieman & Gastright (1981) Existing sample Longitudinal Post only With evidence of initial equivalence	551 kindergarten students in 16 Cincinnati schools receiving Title I Full-day students had preschool experience, half-day did not.	EXP=full-day K (n=410) CTL=half day K (n=141) EXP also had preschool	Pretest (Sept Kinder "Goal card") Boehm (December Kinder) Metropolitan (April Kinder) Metropolitan (4th grade - 70% sample) Metropolitan (8th grade - 50% sample) grade retention special education	NS .35 p<.001 .35 p<.001 .25 p<.01 .25 p<.01 .13 p<.01 .25 p<.001	
Hatcher (1980) ANCOVA adhoc sample	4 school districts in Texas, 2 having half day K and 2 having full-day K 60 students selected at random	Half day vs Full day No information on curriculum or on differences in treatments	Metropolitan Readiness California Test of Personality Valett Developmental Survey Basic	ns ns ns	
Adcock (1980) ANOVA adhoc sample	189 urban and rural kindergarten children in 5 Maryland local education agencies Comparison of existing full-day and half day Ks	EXP=full-day(n=131) CTL=half day(n=58) Measures: Metropolitan (pre and post)	Results ANCOVA Post = pre + K type	.56 p<.001	estimated setting t=3.09, minimum value for p<.001

Table 1 (cont)

Summary of effects of full-day
and half-day kindergarten programs

Non matched groups/pre-post studies

Study	Sample	Treatment	Effects	Size	Notes
Jarvis and Molnar (1986)	New York City 1807 full-day K 223 half day K Citywide conversion to full-day K, Half day were ones unable to convert	Contrasts: Half day/language Full day/language Measures: Brigance Pre/Pst LAB Pre/Post	Results ANCOVA Brigance English speakers Non-English speaker LAB	 .09 ns .45 p<.05 .38 p<.05	
ANOVA half day sample schools in process of going full-day					
Evans and Marken (1984)	metropolitan school district in Wash. state, mostly white, middle class	Contrasts: Full day(n=87) Half day(n=87)	Results ANCOVA CAT Reading attitudes Referral special education	 - ns + -.26 p<.o5	
pre-post ANCOVA students are at different points beyond K	174 1st,2nd 3rd in 2 diff elem schools who had different kindergarten pgms	Measures: Ability test (kinder) CAT (1,2 or 3) Early Chd School Sentiment Teacher ratings Reading attitude			
Derosia (1980)	384 students in kindergarten, 1st and 2nd grades having full or half day kindergarten Jefferson City, Colorado	Full day (n=67) Half day (n=93)	Boehm (adjusted for pretest, SES, age) CTBS (Grade 1) CTBS (Grade 2)	.36 p<.05 ns ns	
pre-post ANCOVA students are at different points beyond K					

Table 1 (cont)

Summary of effects of full-day
and half-day kindergarten programs

Non matched groups/pre-post studies

Study	Sample	Treatment	Effects	Size	Notes
Warjanka (1982)	30 students who scored < 65 on Metropolitan Readiness Test and 40 students who were in same K classes with scores >65	Six month treatment, regular Kindergarten + extended day curriculum based on participant's ability	At pre-test, FDK group 1 standard deviation lower than other group (37.8 vs 20.5) on Metropolitan Readiness Test After six-months of treatment, EKD group and regular group were same (54.3).	(+)	
Slaughter (1983)	96 students who were indentified as at risk and 191 other K students	Additional instruction (119 to 242 hours) Smaller classes (15:1) Curricular change- whole language approach	pre-post design At pre-test FDK group significantly lower than regular group on CAT listening skills subtest (In NCEs, (24 vs 45). At post-test FDK made significant gains, while regular group declined. (36 NCE to 42 NCE)	(+)	
Lysiak and Evans (1976) convenience sample replicated two years	916 students in 111 K classes in Fort Worth, TX	Comparison of six curricular models, for students of differing SES, ethnicity and for full-day and half day	Full day > Half day for low SES and for high SES	(+)	
Alper and Wright (1979)	98 students in Phoenix, Ariz kindergartens in extended day and regular	Full day had longer day (5 vs 2 1/2) and smaller classes (12-25) Teacher visits to homes Three month study	Metropolitan Readiness Test Extended day > regular No report of significance level	(+) ?	no significance levels computed

Table 1 (cont)

Summary of effects of full-day
and half-day kindergarten programs

Non-matched groups/Posttest only studies

Study	Sample	Treatment	Effects	Size	Notes
Humphrey (1983)	Evansville-Vanderburg School District	Contrasts: 2 cohorts 78-79 full=81 half=108 79-80 full=115 half=114	Reading Gates MacGintie 78-79 79-80 CTBS 78-79 Grade Retention 78-79 19% Half 9 Full	(+) (+) (+) (+) (+)	Significance not reported
McClinton and Topping (1984) Post only No evidence of initial equivalence	80 1st graders in 10 public schs randomly selected Exp= enrolled EKD Ctl= enrolled reg	EXP=4'15" CTL=2'40" Major difference was amount of time, not curriculum	CAT at end of K CAT at end of 1st Teacher ratings academic ability EXP>CTL F(1,9) = 5.15 p<.05	- ns - ns 1.42 p<.05	
Harman (1982) Convenience sample	55 half day 66 full-day in K classes in same school and matched on ethnicity, mobility &SES	Post-test only design Comparison of CAT reading and math at end of year	CAT reading math	+.27 ns .40 p<.05	
Chicago's Govt Funded Kindergarten Programs Convenience Sample	110 schools Comparison of existing programs	Contrasts Funding source: Chapter 1 Chapter 2 OEEO Board Funded Format: All Day Half Day No pretests	Percent scoring in first quartile ITBS HDK, chpt 1, size 16 = 26% ADK, chpt 2, size 23 = 39 ADK, , size 26 = 46 OEEO , size 28 = 51 board HDK , size 28 = 73		

Table 2
Summary of effects for full-day kindergarten by quality of study, immediacy of effect and population studied

	Regular or Advantaged Students				Disadvantaged Students			
	Kindergarten		Long term		Kindergarten		Longterm	
Random Assign or Matched	Johnson	+	Johnson	0	Johnson	0	Johnson	0
	Oliver	+	Winter	0	Winter	+	Winter	0
	Winter	0						
Non matched	Hatcher	0	Evans	0	Carapella	+	Niemann	+
	Adcock	+	Derosia	0	Niemann	+		
	Jarvis	0			Jarvis	+		
	Derosia	+			Warjanka	+		
					Slaughter	+		
					Lysiak	+		
					Entwisle	+		

Table 3
Effective Kindergarten Programs
Programs Evaluated with Random Assignment or
Matched Control Group Design

JDRP #	NAME	DEVELOPER	GRADE	CONTENT	INSTRUCTIONAL STRATEGY	EVALUATION DESIGN	MEASURES	EFFECTS	COSTS & TRAINING	ADOPTIONS & ACTIVITY
74-15	Alpha Phonics	So. San Francisco U.S.D.	K	Rdg. Readiness	Readiness phonics program focusing on sequential learning, immediate correction, feedback & game-like presentation for about 1 hr/day	post ANOVA on treatment sch. & remaining 12 in district. stated that IQ & background of T & C equivalent. all students there for K-3.	Metropolitan Ach. readiness ach. G1 ach. G2 ach. G3	 .89 1.14 .90 1.07	$135 for materials classroom 1 day trng pay trnr honorarium & travel	6000 cities 50 states
83-94	Astra Math	So. San Francisco U.S.D.	K	Math Readiness	Comprehensive, structured & sequenced curriculum with 22 self-contained units. Uses multisensory approach & behavior modification & high interest materials.	pre-post random assignment to treatment - control 3 classes each	CTBS fall-sprg	.45 <1> (adj) .30 (not adj)	$ 112 for materials classroom 1 day trng	4000 cities 30 states
77-115	PECCA	Trumbull Public Schools (CT)	K		Development & implementation of early identification procedures & prescriptive educational programs for children entering K with specific potential handicaps	pre-post random assignment to trtmt & control	JANSKY Metropol. Monroe	.67 .57 .88 .96	no data	no data
78-199	TALK	Rockford, IL school system	<-3	Lang.	Lang. specialist in class instruction in listening skills 4 wk 1/2 hour for 6 mos then classroom tchr continues lessons	pre-post ANCOVA on treatment & matched local control. original study (75-6) replication (76-77)	PPVT 75 76 WISC 75 76 PPVT 75 76 (K) 75 76	.25 .42 .38 .46 .26 (K) .74 .39 (K) .55	$50 manual tchr & sub time for tchr to attend 1/2 day trng	572 dists. 33 states 6 int'l currently active

Table 3 (cont)
Effective Kindergarten Programs
Programs Evaluated with Random Assignment or Matched Control Group Design

JDRP #	NAME	DEVELOPER	GRADE	CONTENT	INSTRUCTIONAL STRATEGY	EVALUATION DESIGN	MEASURES	EFFECTS		COSTS & TRAINING	ADOPTIONS & ACTIVITY
79-7	PARC	Wakulla City Crawfordville FL	K-1	Rdg.	Continuous progress using multisensory activities & systematic instruction. Diagnostic & recordkeeping instrument. skill sheets provided.	post ANOVA on treatment & matched local control at end of K & end of 1st. pre ANOVA to insure equivalence	SESAT (II)	#1	#2	3/5 day trng or self trng manual	no exact data(FL&SC) not active at present
							letters	1.12	.55		
							word rdg	.88	ns		
							sent rdg	.25	ns		
							BOEHM	ns			
							KUHLMAN	ns			
							ANDERSON				
							SESAT (I)	ns			
75-37R	INSTRUCT	Lincoln Public Schools	K-3	Rdg.	Individual placement & progress through multi-unit model	ANCOVA c ison of trat & comparable schs. chosen on similar SES, school org & ds compensatory students	Metropolitan			5 days trng	no data
							word know	.35**			
							rdg.	.25*	(2)	materials $100/class	
							spelling	ns			
79-38	PLAY	Bristol,Va	K-1 and 3/4 years	Motor/ Cognitive	Diagnostic/prescriptive direct instruction in perceptual/motor monthly home reinforcement & activities	ANOVA on treatment and control. Control were eligibles (score below cut off) not enrolled because positions filled	BOEHM			na	not active
							75-76	1.77			
							76-77	.23			
							77-78	1.33			

Table 3 (cont)
Effective Kindergarten Programs

Programs Evaluated by Comparison With
Expected Growth, National Norms, or Fall to Spring Growth

ADOPT #	NAME	DEVELOPER	GRADE	CONTENT	INSTRUCTIONAL STRATEGY	EVALUATION DESIGN	MEASURES	EFFECTS	COSTS & TRAINING	ADOPTIONS & ACTIVITY
81-44	CLIPP	Piscataway, NJ	K-12	Rdg. Math	Diagnostic/ prescription approach in acquisition of rdg & math skills providing a mngmt design for coordinating & integrating classroom & support personnel	spring to spring achievement compared to nat'l norms & compensatory growth	CTBS	•		781 (1982-6) from sponsor
78-87	STAMM	Lakewood, CO	K-8	Math	Continuous progress math with mngmt system.	pre-post implementation scores for district & adoption site.	CAT	•	# stdts x 7, avg startup; # stdts x c if wkbks used as consumables	41 states 1500 adoptions
78-184	Education Assessmt. & Inst. for the Educationally Deprived	Kenosha, WI	K-10	Lang.	Extended day K 2-3 hrs in afternoon, additional time for remedial instruction.	pre-post design. fall to spring.	PPVT	•		
78-198	Every Student Every Day	St. Mary Parish Sch. Bd.	K-4 K-6	Math Rdg.	Daily diagnosis, evaluation & prescription, computer scoring for coordination. Pullot design using 40 wins each day.	pre-post design changing %tile fall to spring 7 52 (76) 7 59 (77) 7 32 (82) 2 40 (93)	TOBE (presch. & K)	•		
74-102	Baptist Hill K	Baptist Hill K, Greenville, AL	K	Rdg. Math	Full day K, lrng ctrs, diagnoses individual lrng needs on continuous basis with appropriate learning activities.	pre-post design. fall to spring. 3rd stanine 6th stanine	TOBE	•		no data
74-468	Early Prevention of School Failure	Pontone District Illinois	4,5,6 year olds		Early identification of developmental needs & lrng styles of 4,5, & 6 yr olds. Screning, planning & pull-out 20-30 minute instruction in different modalities at lrng ctrs.	improvement per month on different scales - no comparison data either w/ a control grp or pre implementation	getting data	•	2 day trng $127/clsrm teacher materials	6000 (from sponsor)

Table 3 (cont)
Effective Kindergarten Programs

Programs Evaluated by Comparison With
Expected Growth, National Norms, or Fall to Spring Growth

ADOP #	NAME	DEVELOPER	GRADE	CONTENT	INSTRUCTIONAL STRATEGY	EVALUATION DESIGN	MEASURES	EFFECTS	COSTS & TRAINING	ADOPTIONS & ACTIVITY
84-1	First Level Math	PRIMAR Educational Endt.	K or 1	Math	Sequential curriculum & mngmt system which is diagnostic/prescriptive. Instructional grps formed on basis of pretests. Instruction in 3-4 grps for about 20-30 mins.	pre-post design fall to spring	CIRCUS	• not possible to compute	$35/kit	
74-71	New Adventure in Learning	Monroe Flem. Sch., Tallahassee, FL	K		Individually determined instruction with positive behavior mngmt	pre-post nat'l norm comparison using expected growth	PPVT - mean improvmt 1.67/math Gilmore oral rdg test - 10% on grade level at pre, 57% at post		no curr. data	no curr. data
74-75	Strategies in Early Childhood Education	Waupun, WI	preK and K	Screening	Developmental & screening model. Self instructional, individually paced, learning ctrs, developmentally sequenced materials.	ad hoc comparison of trtmt children with another grp. no evidence of prior comparability			10 sessions inservice	

<2> Effect sizes were computed by determining the t value to generate p<.01 and .05 respectively.

Table 3 (cont)
Effective Kindergarten Programs

Programs Evaluated by Comparison With
Expected Growth, National Norms, or Fall to Spring Growth

ESEA	Name	Location	Serves	Area	Description	Evaluation	Test	Effects	Cost	Adoption
74-91	Right to Read	Glassboro, NJ	K-3	Reading	Diagnostic, prescriptive, indiv. progress model, ungraded.	no control 325 children pre-post	CRI Classrm Rdg. Inv.	avg gain 1.52 yrs	20 hrs inservice + 1 hr/wk	no data
	Project Catch Up	Newport Mesa, CA	K-5	Reading Math	Remedial instruction in rdg & math to underachieving students using diagnoses, presciption	mean gain by grade on CTBS from fall to spring	CTBS fall-spring			
					positive contacts with family	no data on K				
	Amphitheater School District MIP	Tucson, AZ	K		parent involvement once a wk training of parents in game or activity that gives practice in basic skills with followup practice with students who need practice in that skill & monitoring of student progress	comparison to comparable school on percent scoring above 50 %tile 1 year after	CAT	66% vs. 38%	N.D.	N.D.
	VIP	Spokane, WA	K	Develop Skills	develop friendly feeling parents & school, provide training for parents in how to help children at home, to send home games which reinforce skills learned at school	Santa Clara Inv. gain 2.32 mos. in dev. age/month no control grp	Santa Clara Inv. note problem with fall-spg			